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10/593,560

09/20/2006

Masaru Amai

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441 7590 12/16/2009
SMITH, GAMBRELL & RUSSELL
1130 CONNECTICUT AVENUE, N.W., SUITE 1130
WASHINGTON, DC 20036

EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

12/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/593,560 | Applicant(s) AMAI ET AL. | |
| | Examiner Sharidan Carrillo | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>9/20/06, 3/27/07, 4/24/09, 9/21/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II in the reply filed on 8/20/09 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 10 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 10 is indefinite because it is unclear what is meant by "move radially outward the substrate". The examiner suggests the language of "moving radially outward from the center of the substrate". Claim 16 is indefinite for similar reasons.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (6286525) in view of Sato (US2002/0189641).

Re claims 9 and 15, Nishimura et al. teach cleaning a wafer by bringing a brush 8 in contact with the wafer W while rotating the same (Fig. 11b, for example), and spraying liquid droplets from a fluid nozzle 20 onto the wafer, wherein the brush and nozzle are moved radially outward (Figs. 11b, 13a, 17-18), while a cleaning position of the nozzle is kept nearer to the center of the wafer than the brush. Specifically, as the brush is moved radially outward (Fig. 13A for example), the nozzle 20(30) is positioned

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closer to the center of the wafer substrate. Re claim 15, col. 8, lines 55-60 teaches a controller, such as a microprocessor performing the cleaning process.

Nishimura et al. fail to teach a two fluid nozzle. The nozzle of Nishimura et al. teach applying a cleaning liquid (i.e. water) onto the wafer surface. Sato teaches a substrate cleaning apparatus and method. Specifically, Sato teaches a two fluid nozzle which delivers a mist of cleaning fluid in a small quantity and in minute droplets. Sato teaches a forming a cleaning mist comprising a cleaning solution in combination with an inert gas (paragraphs 41-42). The combination of the cleaning solution in combination with a gas offers the advantages of inhibiting scattering of the liquid and the wafer surface and provides the added advantages of providing less cleaning solvent in addition to reducing the time required for the cleaning process to occur. It would have been obvious to the skilled artisan to have modified the nozzle of Nishimura et al., to include a two fluid nozzle, as taught by Sato, for the added advantages of inhibiting scattering of the liquid on the wafer surface, in addition of reducing the amount of cleaning liquid used, thereby reducing the amount of time cleaning occurs. Re claims 10 and 16, in view of the indefiniteness, the limitations are met by the prior art of Nishimura et al. Furthermore, the limitations are met in view of the embodiment of Fig. 13A. Specifically, the brush moves radially outward from the center to the edge of the substrate, and the cleaning position of the nozzle is positioned above the center of the substrate. Since the nozzle can be moved in a reciprocating manner, the nozzle, positioned in the center is also being moved radially outward. Re claims 11 and 17, refer to the embodiment of Fig. 18 of Nishimura et al.. Specifically, after the brush is

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separated from the peripheral edged of the wafer, the cleaning position of the nozzle 20 (20a) is moved to a position (i.e. center) above a portion with which the brush had been in contact immediately before the brush was separated therefrom. Re claims 12 and 18, the limitations are met since both the brush and nozzle move in a reciprocating manner. Re claims 13-14 and 19-20, Nishimura in view of Sato fail to the adjusting the moving speed of the brush relative to the nozzle, such that the brush speed is slower than that of the nozzle. However, it would have been obvious to the skilled artisan to reduce the moving speed of the brush in order to scrub the wafer surface at a slower speed, thereby enhancing the removal of contaminants. Furthermore, it is well known in the art to adjust the speed of the brush, depending upon the amount of contaminants present on the wafer surface. Specifically, it is well known in the art, as evidenced by Kubota et al. (6059891, col. 2, lines 30-45), to reduce the speed of the brush if large amount of contaminants are present on the wafer surface.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakashima et al. teach cleaning both sides of the substrate. Ohtani et al. teach a method of cleaning of a substrate. Sotozaki et al., Uemukai et al., Oh et al., and Ishihara et al. teach cleaning substrate with a brush and nozzle. Hirose et al. teach a substrate processing method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W, F 6:30-5:00pm, alternating Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sharidan Carrillo
Primary Examiner
Art Unit 1792

/Sharidan Carrillo/
Primary Examiner, Art Unit 1792

bsc